NAVAL COMBAT AIRCRAFT:

ISSUES AND OPTIONS

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Congresssional Budget Office

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NOTE

All years referred to in this report are fiscal years unless otherwise indicated.

Details in the text, tables, and figures of this report may not add to the totals because of rounding.

All costs are expressed in fiscal year 1988 dollars of budget authority, using the Administration's January 1987 economic assumptions, unless otherwise noted.

PREFACE

The Navy's plans for its combat aircraft have been a topic of Congressional debate for many years. This year, for example, the Congress debated whether the Navy could afford to purchase two new aircraft carriers while also funding its plans to modernize and increase the number of its combat aircraft. Over the next few years, the Congress may need to make reductions in proposed Navy budgets, which could heighten concerns about the affordability of these plans. Faced with severe budgetary limits, the Congress will make decisions about funding for combat aircraft that will determine the size and capability of Navy and Marine Corps air forces through the mid-1990s. Longer-term decisions about development of two new aircraft will influence force size and composition into the next century. This analysis by the Congressional Budget Office (CBO) analyzes the effects of the Administration's plans for the Department of the Navy's combat aircraft, as expressed in the President's budget for fiscal years 1988 and 1989, but does not reflect ongoing Congressional action. The report also discusses alternatives that would hold down budgets. The study was requested by the Senate Committee on Armed Services. In keeping with CBO's mandate to provide objective analysis, the study contains no recommendations.

Lane Pierrot of CBO's National Security Division prepared the study under the general supervision of Robert F. Hale and John D. Mayer, Jr.; William P. Myers of CBO's Budget Analysis Division provided extensive costing assistance and helped structure the alternatives. The author gratefully acknowledges the contributions of William M. Kostak, Richard L. Fernandez, Jack Rodgers, and Marvin M. Smith of CBO, and Dov S. Zakheim of Systems Planning Corporation. (The assistance of external participants implies no responsibility for the final product, which rests solely with CBO.) Sherry Snyder edited the manuscript. Rebecca Kees and Kathryn Quattrone prepared the final report for publication.

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SUMMARY

Improvements in the U.S. naval forces are the centerpiece of the current Administration's conventional defense policy. The Navy will soon have 600 ships, including 15 deployable aircraft carriers. According to the Administration, a naval force of this size is needed in a major European war to seize control of the northern Norwegian Sea, provide support to the defense of northern Norway, and also make the Soviet Union withhold forces that might otherwise be used against convoys involved in the resupply of Europe. The Navy refers to this approach as its forward offensive strategy. In addition, aircraft carriers are deployed worldwide in peacetime to carry out U.S. military objectives.

While the Navy has already bought the ships to achieve a 600-ship Navy, it has not--based on its own planning factors--bought enough aircraft to meet the requirements of its 15 carriers. Even its current five-year plan would not alleviate the shortfalls in aircraft--the difference between the Navy's stated requirements and its aircraft inventories. This suggests underutilization of expensive aircraft carriers in wartime. Moreover, that plan calls for average real growth in aircraft procurement costs of 7 percent a year from 1987 through 1992, while the latest Congressional budget plan calls for three years of real declines in overall defense spending. Thus, the Navy faces difficult choices as it attempts to procure enough aircraft within severe budgetary limits.

ADMINISTRATION'S PLAN

Over the next five years, the Administration plans to purchase about 1,085 naval combat aircraft. (Combat aircraft are those whose missions might bring them under enemy fire in war. Naval combat aircraft include those for the Marine Corps as well as the Navy.) The five-year program includes the introduction of two new aircraft: a long-range aircraft for antisubmarine warfare (LRAACA), and the V-22 aircraft to improve the Marine Corps' ability to transport personnel and equipment from ship to shore. The plan also includes

major modifications to two planes--the F-14 fighter and the A-6 bomber--to increase their capabilities. All of these plans are consistent with the President's budget for fiscal years 1988 and 1989 and do not reflect ongoing Congressional action.

Aircraft Shortfalls

Despite this procurement, the Navy will be short of its requirements for aircraft. The shortfall will increase from about 110 aircraft in 1987 to 176 aircraft by 1994, the first year when all aircraft bought over the next five years will have been delivered.

Shortfalls are best viewed as a measure of how fully carriers are being utilized. The Navy argues that shortfalls of 176 aircraft need not cause carriers to be deployed without a full load of aircraft. Time devoted to maintenance and other support could be reduced, and planes returning from deployment could immediately be transferred to deploying units. Such actions, however, though probably feasible in peacetime, would reduce the Navy's capability during a major war.

Moreover, these shortfalls could be much larger. The Navy expects to modify some aircraft so that it can retain them longer. If, despite these modifications, the Navy is unable to extend service lives, shortfalls might increase to about 600 aircraft by 1994. Indeed, shortfalls may increase, since the estimates above assume that the Navy can retire many of its planes at ages older than current retirements for the last generation of aircraft.

Aging Aircraft

Naval combat aircraft will also increase in age over this period--from an average of 12.2 years in 1987 to 12.9 years by 1994. Quantifying the operational implications of an aging fleet is difficult. The Navy has argued in the past that an older fleet is less capable and harder to maintain, but it now argues that some of these problems can be overcome by modifying the planes to keep them in service longer. Nonetheless, this aging trend could present problems since the force has already exceeded several earlier Navy goals for the average age of its aircraft.

Cost

Even though it leads to an aging fleet and shortfalls, the Administration's planned funding for naval aircraft--including both combat aircraft and other types in the so-called APN (Aircraft Procurement, Naval) account--would increase from $10 billion in 1987 to $15.7 billion by 1992. After adjusting for inflation, this amounts to real growth averaging 7 percent a year. That growth comes at a time when the latest Congressional budget resolution calls for average annual real declines in total defense spending of as much as 2.4 percent for the three years covered by the resolution (1988-1990).

ALTERNATIVES TO THE ADMINISTRATION'S PLAN

In light of fiscal problems and shortfalls of aircraft, the Navy faces two difficult choices:

- How many carriers should be maintained; and
- Should costs be held down by reducing procurement of current aircraft or by delaying or canceling new programs.

The Navy can attempt to maintain its planned numbers of 15 deployable aircraft carriers and their accompanying 14 wings of aircraft. But if aircraft funding experiences little growth or even declines, the Navy would almost certainly be unable to meet all its aircraft requirements. Instead, the current shortfalls would persist and might increase, suggesting underutilization of assets, especially in wartime. Moreover, if the Navy scales back procurement for most of its aircraft lines to cut costs, and delays retirement of older aircraft to maintain a constant number of planes, it will have an older force and will pay higher unit costs for the planes it buys. Instead, the Navy could minimize this aging and increase in prices by forgoing for some years the benefits of new aircraft programs--such as either the V-22 program for the Marine Corps, a planned upgrade to the A-6 aircraft, or the Navy's planned long-range aircraft for antisubmarine warfare--and by continuing to buy existing aircraft at planned rates. (Delaying or canceling the programs would imply some restructuring of the priorities accorded various missions.)

Alternatively, in the face of budget stringency, the Navy could retain only 13 aircraft carriers in the 1990s--that is, one more carrier than it had in 1980, but two fewer than the 15 carriers it plans to have--and 12 air wings. The shortfalls discussed above would be reduced or eliminated, since requirements would be reduced by the number of aircraft associated with two air wings. Thus, the 13 carriers could be fully supported with aircraft. The smaller number of aircraft carriers and air wings, however, would decrease the Navy's ability to pursue the forward offensive strategy in war and would decrease the number of carriers available for peacetime deployment.

The Summary Table shows four options that underlie these conclusions and compares them with the Administration's plan. For the sake of illustration, each option is designed to achieve sufficient savings so that if all savings were applied to the aircraft procurement account, it would not grow in real cost over the next five years. The first two options maintain the Navy's plan to have 15 carriers, but they cut costs either by pro rata reductions in procurement of current aircraft or by delaying new programs. The second two options retire older aircraft carriers early and so provide for only 13 carriers. Savings from early retirements lessen the need to reduce procurement, but those saving that are needed are again achieved either by pro rata reductions or by delaying new programs.

LONG-TERM CONSEQUENCES OF THE ADMINISTRATION'S PLANS

Difficulties associated with procurement of naval aircraft may last beyond the next five years. In the 1990s, the Navy plans to begin procurement of two new planes for its fighter and attack forces: the Advanced Tactical Aircraft (ATA) and a variant of the Air Force's Advanced Tactical Fighter (ATF). These new planes are intended to replace the A-6 attack aircraft and the F-14 fighter/interceptor, respectively.

If its aircraft budget grows at an average real rate of 3 percent a year for the next 20 to 30 years, the Navy should be able to buy large

SUMMARY TABLE. COMPARISON OF THE ADMINISTRATION'S PLAN AND ALTERNATIVES

Plan/ Alternative	Number of Carriers	Net Aircraft Shortfall (Overage) in 1994	Average Age of Naval Combat Aircraft in 1994 (In years)		Range of Increase in Unit Costs Above Those in Administration's Plan, 1988-1992 (In percents)	Decrease in Number of Aircraft Bought 1988-1992 Relative to Administration's Plan
			All Aircraft	Fighter/ Attack		
Administration's Plan, 7 Percent Real Growth	15	176	12.9	10.3	n.a.	n.a.
Zero Real Growth Alternatives						
Option I: Reduce Procurement Evenly; Delay Retirements	15	361	14.2	11.4	7 to 82	306
Option II: Delay V-22 Three Years; Cancel A-6F Modification	15	216	13.6	10.6	n.a.	118
Option III: Reduce Force Structure; Reduce Procurement Evenly	13	(2)	13.4	10.6	2 to 12	81
Option IV: Reduce Force Structure; Cancel A-6F Modification; Delay LRAACA	13	(52)	13.3	10.4	n.a.	36

SOURCE: Congressional Budget Office using data from the Department of the Navy.

NOTE: n.a. = not applicable.

quantities of these planes and meet its long-term numerical requirements, though only if its projections of the costs of the new aircraft prove to be accurate. (While 3 percent per year may appear optimistic in the near term, it was selected to reflect projections of growth in the gross national product (GNP), thus keeping defense spending at a constant share of GNP over the long term.) In fact, at the lowest projected costs, the Navy could buy 25 percent more aircraft than its requirements call for, suggesting some room for error.

These projections of cost, however, bear little resemblance to historical patterns of growth in real costs of fighter and attack aircraft. Historically, cost increases from one generation of aircraft to the next have ranged upward from 150 percent, whereas the Navy's current estimates range from 0 percent to 60 percent. Substantial shortfalls relative to requirements, or pressure for increased funding, could occur if the ATA and Navy ATF development programs experience historical patterns of cost growth. In fact, the Navy might be able to support only about 50 percent of its requirements under some historical patterns. Although many highly uncertain assumptions underlie these findings, there seem to be as many assumptions that lead to more pessimistic results as there are assumptions that make it more likely that the Navy will meet its numerical requirements for aircraft.

It may seem absurd to worry about naval aircraft requirements so far in the future, but critical design decisions that determine costs of both these planes are being worked out now. If the Congress waits until the planes are initially fielded in the 1990s, costs per plane will have already been largely determined. Instead, as it has done in the case of the Air Force's new Advanced Tactical Fighter, the Congress may wish to place a cap on costs for these new Navy aircraft.

CHAPTER I

INTRODUCTION

The Department of the Navy (DoN), which includes the U.S. Marine Corps, currently has about 3,650 combat aircraft. These aircraft operate off aircraft carriers as well as from land bases and are deployed worldwide. The aircraft accomplish a wide variety of tasks. Some are designed to strike land targets; others protect ships or land targets from enemy attack, transport Marines ashore in amphibious assaults, or provide support functions such as electronic surveillance. Along with combat aircraft in the Air Force, these planes play an important role in U.S. defenses.

The Navy plans to expand modestly the number of its naval aircraft in coming years, consistent with its plans to increase the size of its fleet to 600 ships, including 15 deployable aircraft carriers. At the same time, the Navy plans to modernize many types of naval aircraft. (The term "naval aircraft" in this report refers to aircraft in both the Navy and Marine Corps.)

Procuring naval aircraft to expand and modernize forces is expensive. Total DoN aircraft procurement in 1987 amounted to $10.0 billion, which included costs of combat aircraft, trainers, auxiliary aircraft, modifications, and spare parts. About $5.9 billion of the $10.0 billion paid for procurement of the 11 types of combat aircraft that are the focus of this study.

By 1992, the last year of the Department of Defense's (DoD's) current five-year plan, the Administration plans to buy 10 types of combat aircraft, with total aircraft spending of $15.7 billion. After adjusting for inflation, this plan will result in an average annual real increase in total aircraft spending of 7 percent. This large planned increase in cost has heightened concern over a number of issues including the adequacy, balance, efficiency, and affordability of aircraft procurement.

Is Procurement Sufficient?

Some Members of the Congress are concerned that, despite planned spending increases, the Navy may not be procuring enough aircraft to meet its force requirements. They question the utility of maintaining 15 deployable aircraft carriers in the absence of enough planes to fill them.1/ As this paper will discuss, planned Navy aircraft inventories will fall short of the Navy's own stated requirements in each of the next seven years. That shortfall could be large under some assumptions about such factors as the age at which aircraft are retired.2/ Other assumptions, however, could lead to relatively small shortfalls that the Navy argues are manageable.

Is Procurement Balanced?

The House Committee on Armed Services has expressed concern that the Navy is buying too many of some aircraft and not enough of others. Partially for this reason, the committee canceled funding for one of the Navy's aircraft, the AV-8, and increased funding for several others (among them, the EA-6 and F-14). The Senate Committee on Appropriations shares this concern about the mix of aircraft types.

Are Navy Aircraft Being Procured at Efficient Rates?

The Congress has repeatedly expressed concern that the Navy procures too many different kinds of aircraft, making it financially impossible for the service to procure any of them in large quantities. Although it would be difficult for the Navy to support its diverse missions without procuring many different kinds of planes, under the Navy's current five-year plan three combat aircraft lines are being procured at less than minimum economic rates as defined by the Department of Defense (DoD), leaving eight of the eleven lines to be

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1. The Navy will actually have 16 carriers, but one will be undergoing such an extensive overhaul that it could not be deployed for many months.

2. "Shortfall" is the term used to describe the difference between the number of aircraft the Navy deems necessary to fulfill its missions and the number of aircraft in its inventory.

procured at or above minimum rates during the period.3/ And, over the past five years, average procurement rates for naval combat aircraft amounted to only 35 percent of the rates that plant capacity for those planes would allow.

Are the Navy's Aircraft Plans Affordable?

Real growth in the Administration's funding request for naval aircraft procurement averages 7 percent a year over the next five years. Even so, there will be shortfalls of aircraft. Eliminating these shortfalls would lead to even higher real growth.

Seven percent annual real growth is significantly more than the real growth in the overall DoD budget. The Administration's budget request for defense calls for average annual real growth of 3 percent over the next five years, but the latest Congressional budget resolution calls for average annual real declines in the DoD budget of as much as 2.4 percent over the next three years. Thus, the Administration's naval aircraft plan appears to be unaffordable unless one or more of the following major policy changes is made: the Congress gives DoD more money than currently anticipated, the Navy receives more than its current share of DoD funding, or the Navy gives aircraft procurement a higher priority than it accords other portions of the budget.

To resolve these issues, the Congress and the Administration must make some difficult choices. More money could be provided for naval aircraft, and this study estimates the additions needed under various assumptions. If more funds are not forthcoming, the Navy may have to reduce its planned numbers of carriers and wings. Alternatively, the Navy could maintain the planned number of carriers but postpone procurement of new types of aircraft in order to hold down costs. Finally, the service could reduce procurement of existing aircraft and keep older ones longer. All these approaches could affect the capability of naval aircraft in both peacetime and war.

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3. Congressional Budget Office, *Effects of Weapons Procurement Stretch-outs on Costs and Schedules* (November 1987).

This study addresses these important decisions. Chapter II provides background on naval aircraft missions and the aircraft that carry them out and discusses the rationale behind the Navy's strategy. Chapter III analyzes the Administration's program for naval aircraft, and Chapter IV describes alternative approaches. The final chapter considers the long-term budget outlook for procurement of naval aircraft.

CHAPTER II

NAVAL MISSIONS, AIRCRAFT, AND STRATEGY

The Navy's plans for aircraft procurement reflect the service's diverse missions in peacetime, during minor conflicts, and in a major war. At the heart of the Navy's current five-year procurement program is the pivotal role it envisions for its aircraft carriers. As background for understanding the program, this chapter discusses the Navy's missions and the aircraft that perform them and then considers both the Navy's rationale for its air strategy and some views opposing that strategy.

MISSIONS

The many combat missions of naval aircraft can be subsumed under five categories: fleet air defense and counterair mission, strike warfare, antisubmarine warfare, electronic warfare, and amphibious assault. Each mission requires different capabilities in the aircraft. Most aircraft are capable of performing more than one type of mission, and many also perform supporting missions that are not discussed here in detail.

Fleet Air Defense and Counterair

The fleet air defense and counterair missions are performed by Navy fighters; Marine Corps fighters would have primarily counterair missions, though they might need to defend the fleet from shore bases or--in emergency situations--from amphibious ships. In the fleet air defense mission, the fighters attack incoming enemy bombers seeking to destroy aircraft carriers and their accompanying ships and amphibious task forces. DoD considers the Soviet Union to be the most likely adversary. And since Soviet bombers are now expected to carry cruise missiles that, according to the Navy, can be launched from distances greater than 250 miles, the speed with which the